CLAIMS

1. Method of generating line properties of a signal line including generating (401) a frequency dependent line input impedance ($Z_{in}(f)$) for a loop, the loop including the signal line (2) and a remote device (3), the method being characterized by:

- Generating (402) an absolute value function ($|Z_{in}(f)|$, A1) from the frequency dependent line input impedance ($Z_{in}(f)$), the function being essentially periodic;

- Selecting (408) at least two consecutive extreme values (Max1;Max2) of the same type of the absolute value function ($|Z_{in}(f)|$);

- Generating (409) a frequency distance (FD1) based on said at least two extreme values;

- Generating (410) a line length value (L) based on the frequency distance (FD1) and a velocity of propagation (*vop*) for a signal on the signal line (2).

2. Method of generating line properties of a signal line according to claim 1, wherein the frequency distance is a mean value (MV1,MV2,MV3) between at least two different frequency distances (FD1-FD4), each of which reaches between two consecutive ones of the extreme values (Max1,Max2,Max3; Min1,Min2,Min3) of the same type.

3. Method of generating line properties of a signal line according to claim 1 or 2, the method being performed as a single ended loop test and including:

- selecting a test transceiver (31) suitable for communication purposes;

- connecting (603), in a calibration process, at least three impedances (9) of each a predetermined value to a signal line connection (5) of the test tranceiver (31);

- generating (606) frequency dependent echo transfer functions ($H_{echo}(f)$) utilizing test signals (vt_{in} , vt_{out}) and said at least three impedances (9); and

- generating (608) transceiver model values ($Z_{h0}(f), Z_{hyb}(f), H_{\infty}(f)$) with the aid of said echo transfer functions ($H_{echo}(f)$) and the corresponding impedance values (9), said model values including an echo transfer function ($H_{\infty}(f)$) for the test transceiver (31) with open line connection (5), a transceiver impedance value ($Z_{hyb}(f)$) as seen from the line (2) side and a product ($Z_{h0}(f)$) of said transceiver impedance value ($Z_{hyb}(f)$) and an echo transfer function ($H_0(f)$) for the transceiver (31) with shortcut line connection (5).

4. Method of generating line properties of a signal line according to claim 3 including storing (609) the transceiver model values ($Z_{h0}(f), Z_{hyb}(f), H_{\infty}(f)$) obtained in the calibration process.

5. Method of generating line properties of a signal line according to claim 4 including:

- selecting (610) a transceiver (1) for communication purposes of the same type of hardware as said test transceiver (31) in the calibration process;

- connecting (701) the loop to the transceiver (1);

- sending (702), via the connected transceiver (1), a loop test signal (v_{in}) to the line (2);

- measuring (703), via said transceiver (1), the loop test signal (v_{out}) as reflected;

- generating (704) a loop echo transfer function ($H_{echo}(f)$) for the loop (2,3);

- generating (705) the frequency dependent line input impedance value ($Z_{in}(f)$) for the loop (2,3) with the aid of the stored transceiver model values ($Z_{h0}(f), Z_{hyb}(f), H_{\infty}(f)$) and the generated echo transfer function ($H_{echo}(f)$).

6. Method of generating line properties of a signal line according to claim 1, 2 or 5, wherein a short loop length decision value (*dValue*) is estimated, the method including:

- generating, in a predetermined loop length frequency range ($f_1 - f_2$), an impedance mean value (*mValue*) of the absolute value ($|Z_{in}(f)|$) of the line input impedance ($Z_{in}(f)$);

- generating, in the loop length frequency range, the short loop length decision value (*dValue*) based on the line input impedance ($Z_{in}(f)$) and said impedance mean value (*mValue*);

- comparing the short loop length decision value (*dValue*) with a predetermined threshold value (*thValue*);

- deciding the loop to be a short loop based on said comparison.

7. Method of generating line properties of a signal line according to claim 1, 2, 5 or 6 including:

- calculate an average attenuation value (AA1) for a selected set of telecommunication cables;

- estimate the length (L) of the short signal line (2);

- generate an attenuation value (LA1) for the line (2) by multiplying the average attenuation value (AA1) with the line length (L).

8. Method of generating line properties of a signal line according to claim 1, 2, 5 or 6 including:

- selecting one of the minimum values (Min1) of the absolute value function ($|Z_{in}(f)|$, A1) and an adjacent of the maximum values;

- generating an insertion loss (*loss*) value for the line (2) based on said minimum and maximum values.

9. An arrangement for generating line properties of a signal line, the arrangement including a front end device (MD1;1) having connections (5) for a loop including the signal line (2) and a remote device (3), the arrangement including circuits (LU1;42,42,43) in the front end device (MD1;1) for generating a frequency dependent line input impedance ($Z_{in}(f)$) for the loop, the arrangement being characterized by:

- a calculation unit(CU1;11) for generating an absolute value function ($|Z_{in}(f)|$) from the frequency dependent line input impedance ($Z_{in}(f)$), the function being essentially periodic;

- circuits in the calculation unit (CU1;11) suitable for:

a). selecting at least two consecutive extreme values (Max1,Max2) of the same type of the absolute value function ($|Z_{in}(f)|$);

b). generating a frequency distance (FD1) based on said at least two extreme values;

c). generating a line length value (L) based on the frequency distance (FD1) and a velocity of propagation (*vop*) for a signal on the signal line (2).

10. An arrangement for generating line properties of a signal line according to claim 9, wherein the calculation unit (CU1;11) is arranged for calculating a mean value (MV1,MV2,MV3) between at least two different ones of the frequency distances (FD1-FD4), each of which reaches between two consecutive ones of the extreme values (Max1,Max2,Max3; Min1,Min2,Min3) of the same type.

11. An arrangement for generating line properties of a signal line (2) according to claim 9 or 10, wherein the front end device is a transceiver (1,31) for communication purposes, the arrangement in a calibration mode including:

- a test transceiver (31) connected to a measurement device (32);
- the measurement device (32) being arranged to generate, in a calibration process, calibration values for the transceiver (1,31) for communication purposes with the aid of at least three impedances (9) and test signals (vt_{in}, vt_{out}), the impedances (9) having each a predetermined value and being connected to the line connection (5) of the test tranceiver (1, 31);
- the measurement device (32) being arranged to generate a frequency dependent echo transfer function ($H_{echo}(f)$) for the test transceiver (1,31) connected to the respective one of the impedances (9);
- the measurement device (32) being arranged to generate transceiver model values ($Z_{h0}(f), Z_{hyb}(f), H_{\infty}(f)$) with the aid

of said echo transfer function ($H_{echo}(f)$) and the corresponding impedance values (9), said model values including an echo transfer function ($H_{\infty}(f)$) for the transceiver (1, 31) with open line connection (5), a transceiver impedance value ($Z_{hyb}(f)$) as seen from the line (2) side and a product of said transceiver impedance value ($Z_{hyb}(f)$) and an echo transfer function ($H_0(f)$) for the transceiver (1, 31) with shortcut line connection (5); and

- the transceiver for communication purposes (1,31) being arranged to generate the frequency dependent line input impedance ($Z_{in}(f)$) with the aid of the transceiver model values ($Z_{h0}(f), Z_{hyb}(f), H_{\infty}(f)$).

12. An arrangement for generating properties of a signal line (2) according to claim 11, the arrangement including a memory (12, 33) for storing the transceiver model values ($Z_{h0}(f), Z_{hyb}(f), H_{\infty}(f)$).